

## MEMORANDUM

**TO:** Frank Battaglia and Kim Tisa, EPA

**FROM:** AEI Consultants

**SUBJECT:** BASF Corporation  
Former Ciba-Geigy Facility  
Lot 1102, 180 Mill Street, Cranston, Rhode Island  
PCB Analysis Using Dexsil Method Standard Operating Procedure

**DATE:** April 16, 2018

### INTRODUCTION AND PURPOSE

AEI Consultants (AEI) has prepared this technical memorandum to present the Standard Operating Procedure (SOP) for the use of the PCB screening tool, Dexsil L2000DX PCB/Chloride analyzer, for the upcoming remedial effort at the above referenced Site. The goal is to uniformly use the Dexsil analyzer as a quantification method, in conjunction with a subset of traditional laboratory analysis via EPA Method 8082A/34503540C Soxhlet Extraction, to quantify the in-situ PCB concentrations and demonstrate compliance with TSCA (40 CFR 761.61(c)) and RIDEM Remediation Regulation (DEM-DSR-01-93) post-excavation cleanup standards. This SOP incorporates the results of a PCB Analysis Comparability Study previously submitted to EPA on December 5, 2017 with subsequent comments by EPA.

### COMPARABILITY STUDY RESULTS/RECOMMENDATIONS

As detailed in Section 6.2 of the Sampling and Analysis Plan (SAP), submitted to EPA and RIDEM as Appendix F of the Corrective Measures Implementation Work Plan on September 8, 2017, AEI collected representative soil samples from Lot 1102 and from a soil stockpile as part of a PCB Data Comparability Study. The objective of the study was to design the protocol for post-excavation verification sampling analysis using a combination of field-screening using an EPA-approved field extraction and analysis technology (EPA Method 9078, called Dexsil herein) and laboratory analytical data. The SOP considers the Site's two remedial action objective metrics:

1. The 25 mg/kg metric where site soils will be uniformly remediated to below 25 mg/kg.
2. The 10 mg/kg metric; soils remaining above this metric and subject to potential infiltration from precipitation must be covered with an impermeable HDPE liner, and the Site's post-excavation 95% Upper Confidence Level (UCL) PCB concentration must be < 10 mg/kg.

The Dexsil results were evaluated against laboratory data to determine how the Dexsil data should be used in making field decisions. The evaluation included a regression analysis and calculation of the relative percent difference (RPD) for each sample. AEI determined whether the use of a



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multiplier for the field screening results would be necessary to ensure that false negatives are eliminated (i.e., soils that actually contain either >25 mg/kg or >10 mg/kg are not identified as either <25 mg/kg or <10 mg/kg, respectively).

The comparison study showed the following:

1. While on average the Dexsil overpredicted the actual concentrations, the screening results were susceptible to underprediction within the 3 mg/kg to 30 mg/kg range.
2. The correlation for concentrations greater than 10 mg/kg was excellent ( $R^2 = 0.99$ ), however, for concentrations  $\leq 20$  mg/kg the correlation was degraded.
3. The correlation for concentrations less than 10 mg/kg was marginal ( $R^2 = 0.22$ ), however, the Dexsil was generally biased high (8 of 11 results).

Given these observations, the conclusion is that the Dexsil analyzer can be used for post-excavation verification sampling analysis with the following condition intended to eliminate possible false negatives of the 10 mg/kg and 25 mg/kg metrics:

- Use a conservative multiplier of 2.0 for the Dexsil data, i.e., a reading of 5 mg/kg on the Dexsil will be converted to 10 mg/kg.

In accordance with the Field Sampling Plan in the CMI (Appendix F) for every fifth Dexsil sample taken (i.e., 20% frequency), a duplicate sample will be submitted for laboratory analysis using EPA Method 8082/3540.

## **PROPOSED USE OF THE DEXSIL METHOD**

AEI proposes to use the Dexsil analyzer for determining PCB concentrations in soils during the excavation process and post-excavation to confirm that the site-specific PCB Media Protection Standard has been achieved. All Dexsil results less than 30 mg/kg will initially be multiplied by a factor of 2.0. As described below, during the initial phase of project implementation, AEI will collect data to refine the scale of the factor and adjust it as appropriate with approval by the EPA.

The Dexsil analyzer will not be used to characterize soils for disposal characterization purposes. The Dexsil analyzer will also not be used to determine post-excavation PCB concentrations within the Floodway where <1 mg/kg must be achieved. However, it may be used during the excavation process in the Floodway to determine when it is appropriate to collect post-excavation samples for laboratory analyses.

## **COMPARABILITY STUDY ADDENDUM**

AEI will complete an additional study to supplement the existing data, specifically within the 3 to 30 mg/kg range, to refine the scale of the multiplier. This will be accomplished during the completion of the first excavation area on the Site. AEI will collect duplicate samples for laboratory analysis from each location with a result of 30 mg/kg or less (without the application of a multiplier). A minimum of 9 duplicate samples will be collected. AEI will determine the

relative percent difference (positive or negative) for each sample and recalculate a correlation coefficient using all the data collected during both studies. Based on the results, AEI will present recommendations for altering the multiplier, as appropriate, for EPA approval.